

CLAIMS

What is claimed is:

1. A wire comprising:
a conductor extending along a longitudinal axis, an insulation surrounding the conductor and at least one first channel extending generally along the longitudinal axis to form an insulated conductor, wherein an outer peripheral surface of the conductor forms one side of the at least one first channel, the channel containing a gas.
2. The wire of claim 1, wherein at least a portion of the at least first channel is in the insulation.
3. The wire of claim 1, wherein at least a portion of the at least first channel is in the conductor.
4. The wire of claim 1, wherein an outer peripheral surface of the conductor forms one side of the at least one first channel.
5. The wire of claim 1, wherein the gas is in contact with the conductor.
6. The wire of claim 1, wherein the gas has a dielectric constant that differs from a dielectric constant of the insulation.
7. The wire of claim 6, wherein the at least one first channel contains air.
8. The wire of claim 1, wherein the gas is unassociated with closed-cell gas pockets.
9. The wire of claim 1, wherein the gas has a dielectric constant of approximately one.
10. The wire of claim 1, wherein the insulated conductor has an overall dielectric constant of less than approximately 2.0.
11. The wire of claim 1, wherein the insulation includes a plurality of first channels.

12. The wire of claim 11, wherein no one of the plurality of first channels has a cross-sectional area greater than about 30% of a cross-sectional area of the insulation.
13. The wire of claim 1, wherein the insulation fully surrounds at least one second channel separate from the at least one first channel.
14. The wire of claim 1, further comprising an outer jacket surrounding the insulation.
15. The wire of claim 1, wherein two insulated conductors are twisted together to form a twisted pair.
16. The wire of claim 15, wherein the cross-sectional area of the channel for a first of the twisted pairs is different than the channel for a second of the twisted pairs to reduce delay skew between them.
17. The wire of claim 16, wherein the delay skew is no greater than 15 ns between the insulated conductors.
18. The wire of claim 1, wherein the conductor is solid copper.
19. The wire of claim 1, further comprising a secondary insulation located between the conductor and the insulation, wherein an outer peripheral surface of the secondary insulation forms one side of the at least one first channel.
20. The wire of claim 1, wherein the insulated conductor passes a test selected from the group consisting of NFPA 255, NFPA 259, NFPA 262 or combinations thereof.
21. The wire of claim 1, wherein the insulated conductor generates at least 10% less smoke when burned according to a UL 910 Steiner Tunnel test when compared to an insulated conductor without channels in its insulation.

22. The wire of claim 1, wherein the insulated conductor spreads flame at a rate at least 10% slower when burned according to a UL 910 Steiner Tunnel test when compared to an insulated conductor without channels in its insulation.
23. The wire of claim 1, wherein a shape of the at least one first channel is selected from the group consisting of rectangular, trapezoidal and arched.
24. An insulated conductor comprising:
a conductor having a length; and
an insulation surrounding the conductor and having substantially the same length as the conductor,
wherein the insulation includes at least one first channel that extends generally the length of the conductor and wherein an outer peripheral surface of the conductor forms one side of the at least one first channel, the channel material including a gas in contact with the conductor.
25. A communication wire for transmitting data and other signals including a plurality of twisted pairs comprising:
for each of the twisted pairs a conductor extending along a longitudinal axis, an insulation surrounding the conductor and at least one first channel in the insulation extending generally along the longitudinal axis to form an insulated conductor, wherein an outer peripheral surface of the conductor forms one side of the at least one first channel; and
wherein the cross-sectional area of the channel for a first of the twisted pairs is different than the channel for a second of the twisted pairs to reduce delay skew between them.
26. A wire comprising a component extending along a longitudinal axis and including at least one first channel extending generally along the longitudinal axis,
wherein the component is selected from a conductor, insulation, a jacket or combinations thereof to form a channeled component containing a gas,

with the proviso that where the channeled component consists of an insulation, an outer peripheral surface of a conductor forms one side of the at least one first channel.

27. The wire of claim 26, wherein the channeled component includes at least a channeled jacket.

28. The wire of claim 27, further comprising a core element extending along the longitudinal axis, wherein the channeled jacket surrounds the core element to form an isolated core.

29. The wire of claim 28, wherein the core element is selected from the group consisting of a copper conductor, a fiber optic conductor, an insulated conductor, a twisted pair, insulation, a shield, a separator and combinations thereof.

30. The wire of claim 28, wherein the core element includes a channeled insulation, a channeled conductor, or combinations thereof.